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SC17 BOF : PowerAPI , GEOPM and Redfish  
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# RAFPA – Redfish Agent For Power API



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## Agenda

- Business Context
  - What is Redfish
  - Who is behind Redfish.
  - Redfish Resource Mapping
- RAFPA
  - Introduction
  - Architecture
  - Key Features
  - Future Plan
  - Demo



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**Redfish**



## What is Redfish?

- **Industry Standard RESTful API for IT Infrastructure**

- HTTPS in JSON format based on Odata v4
- Equally usable by Apps, GUIs and Scripts
- Schema-backed but human-readable

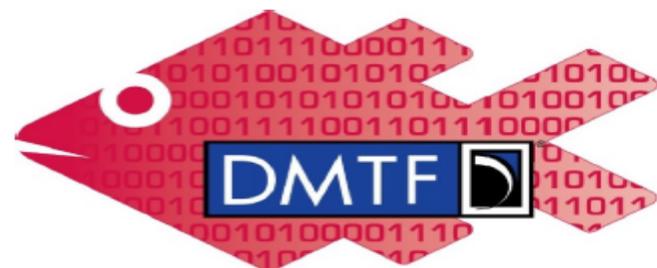
- **Version 1 focused on Servers**

- A secure, multi-node capable replacement for IPMI-over-LAN
- Add devices over time to cover customer use cases & technology
  - PCIe Switching, Local Storage, NVDIMMs, Multifunction Adapters, Composability
- Intended to meet OCP Remote Machine Management requirements

- **Expand scope over time to rest of IT infrastructure**

- Working with SNIA to cover more advanced storage.
- Plan on working with partners like the Green Grid to cover Power/Cooling.
- Goal is to accommodate or map existing switch standards over time.

[www.dmtf.org](http://www.dmtf.org)



## Redfish

# Scalable Platforms Management Forum (DMTF Group that Defines Redfish)



Co-Chairs: Jeff Autor (HPE), Paul Vancil (Dell)

## Leadership Companies



## Supporting Companies

AMI, Cisco, Fujitsu, Western Digital, Huawei, IBM, Insyde Software, Mellanox, NetApp, Oracle, Microsemi, Qualcomm, Seagate

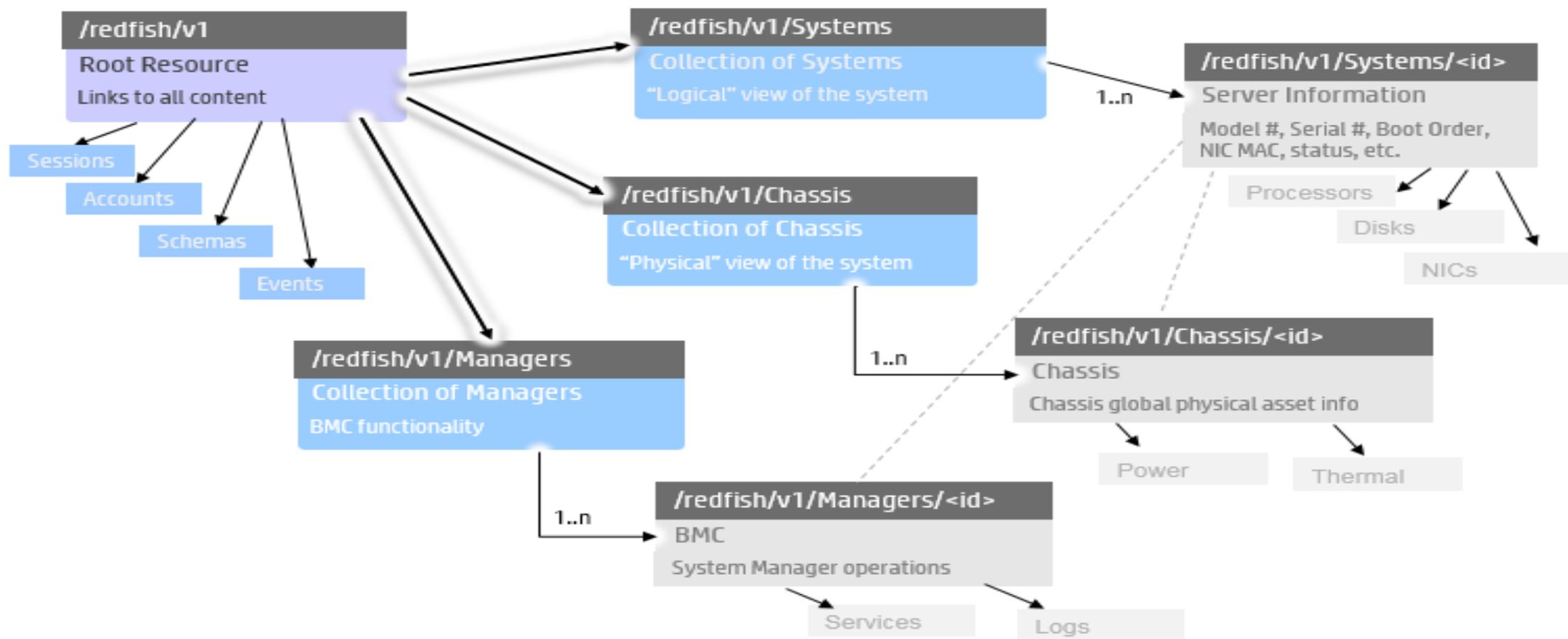
## Industry Alliance Partners

- OpenCompute Project
- UEFI - Collaborating on Firmware Update and Host Interface work
- SNIA – Collaborating on Storage modeling/alignment between SSM and Redfish
- TGG – Pursuing relationship to work on Power/Cooling (existing DMTF Alliance Partner)

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## Resource map (highlights)

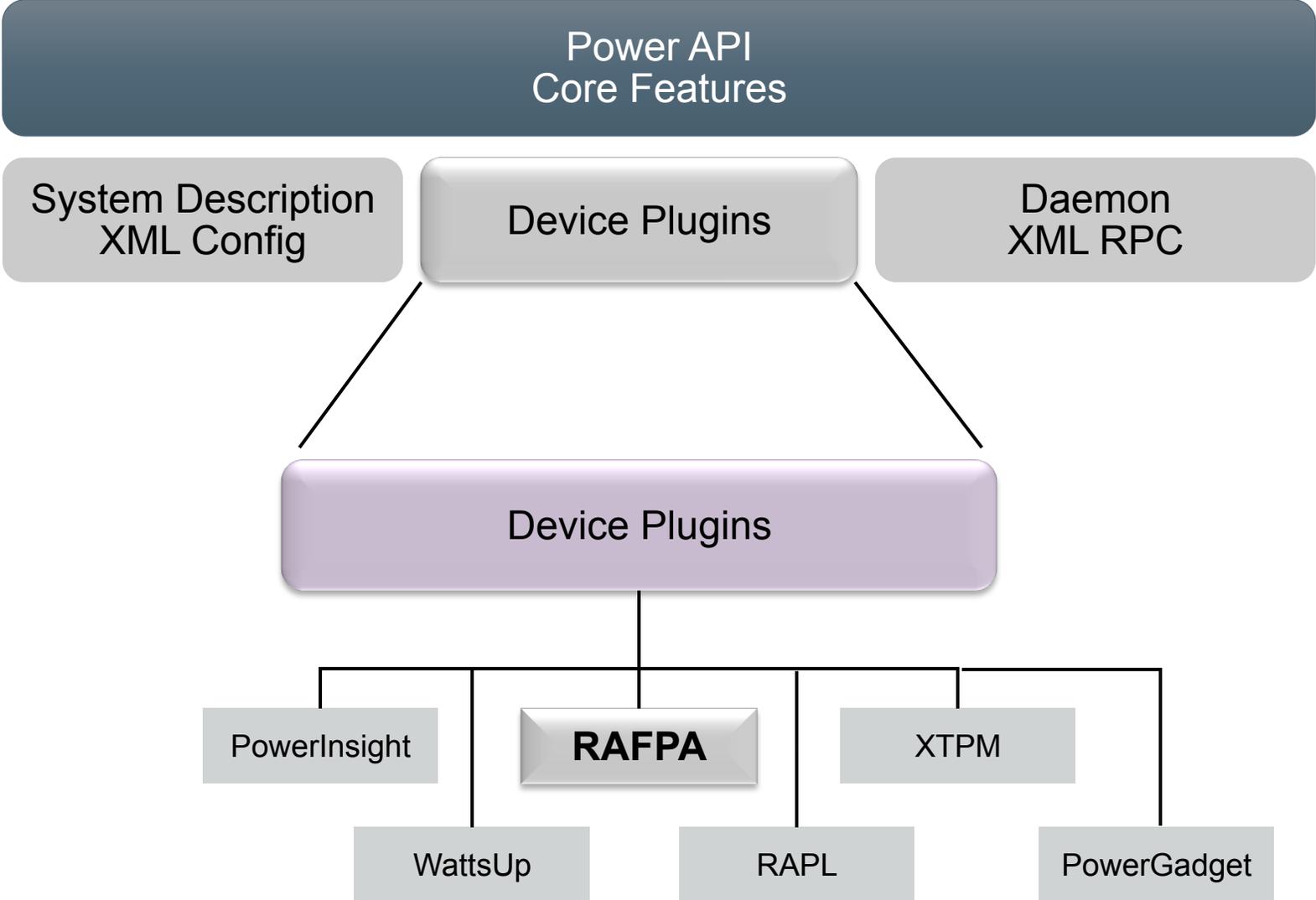


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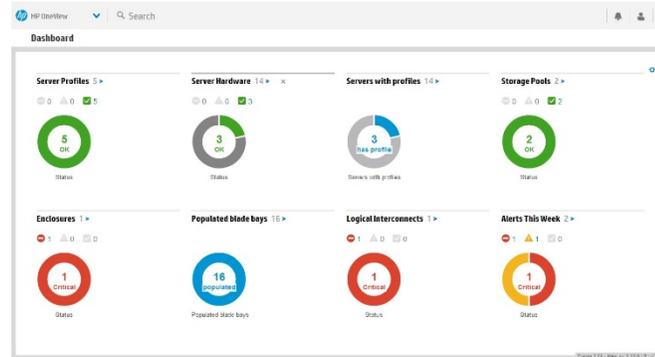
# RAFPA

## Enabling Redfish Support for PowerAPI

# RAFPA – Redfish Agent for Power API



# RAFPA - Present and Future



Power API

RAFPA

Redfish



# Key Features of RAFPA

## Easy Installation

- Automatically resolve all the prerequisites
- Single command installation.

## Open Source

- Use of all open source Libraries

## Monitoring

- Power, Temperature, CPU states, Voltage, Frequency

## Power Control

- Configure CPU Power and Performance States
- Power capping and Reset option

## Easy Configuration

- Add a new attribute with minimal effort
- Readable Configuration files (yaml)

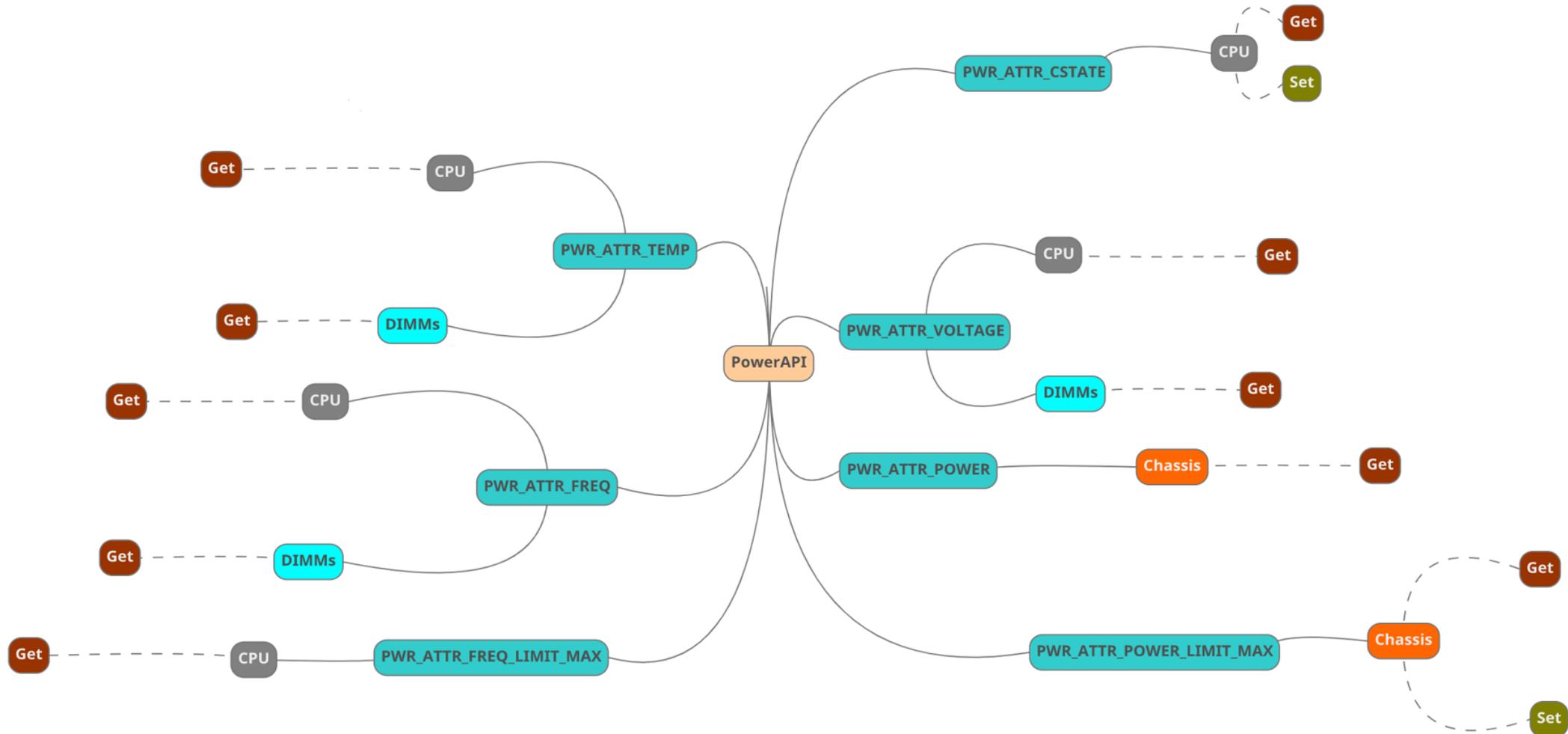
## In Band and Remote Communication Support

- Daemon Architecture for handling multiple nodes over management network
- In Band for network less communication

## Vendor Neutral

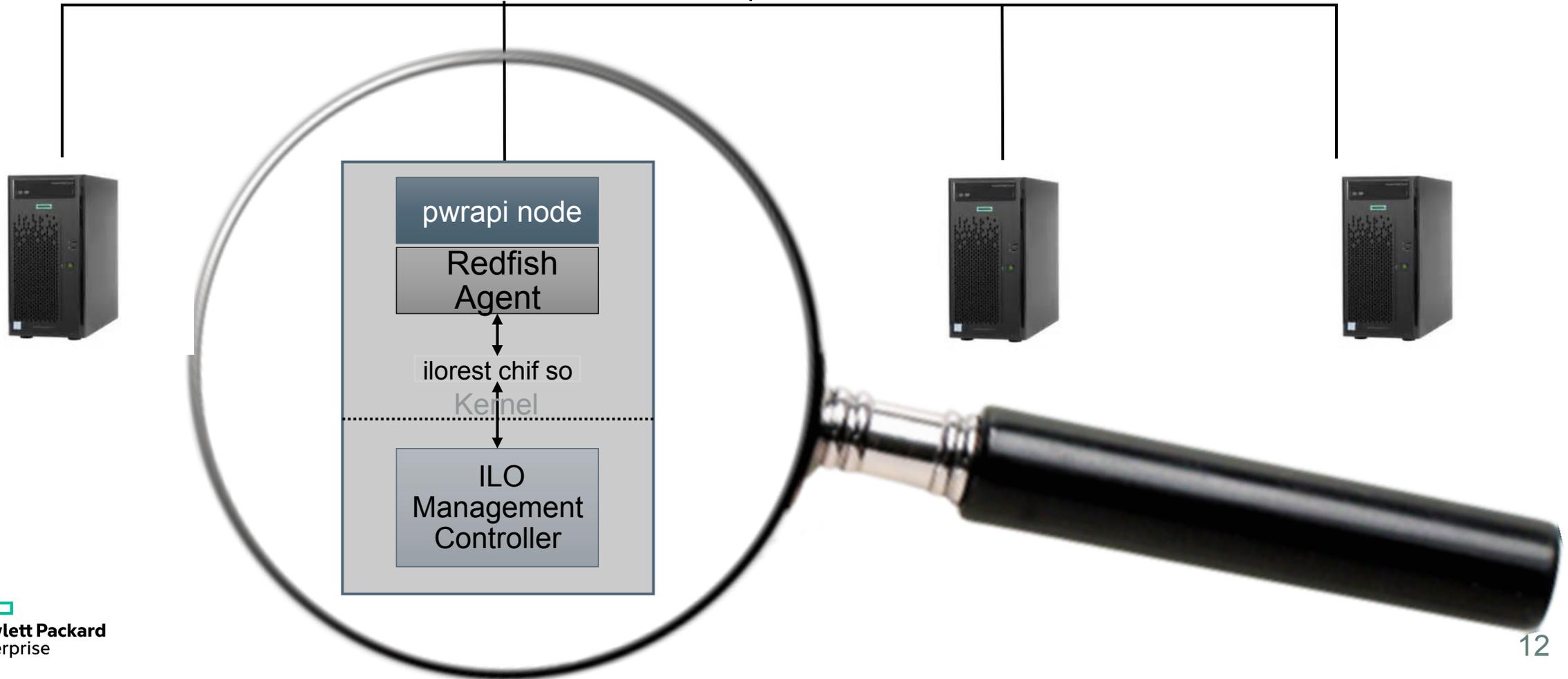
- Support for any new redfish compliant server

# Power API Attributes Coverage – Monitoring and Control



# Communication Channels

In Band(Only HPE Servers) **Management Node**  
PowerAPI Daemon

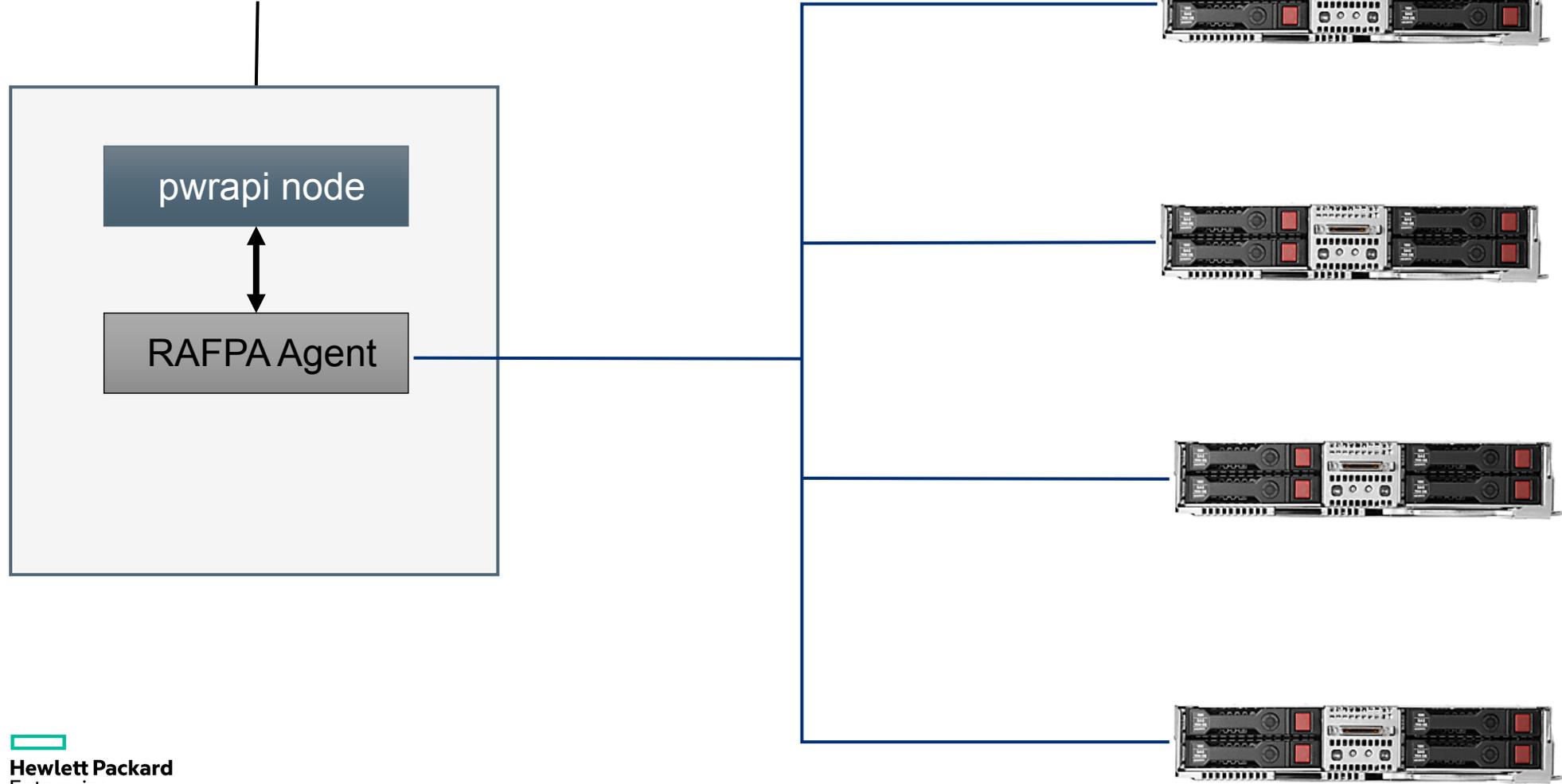


# Communication Channels

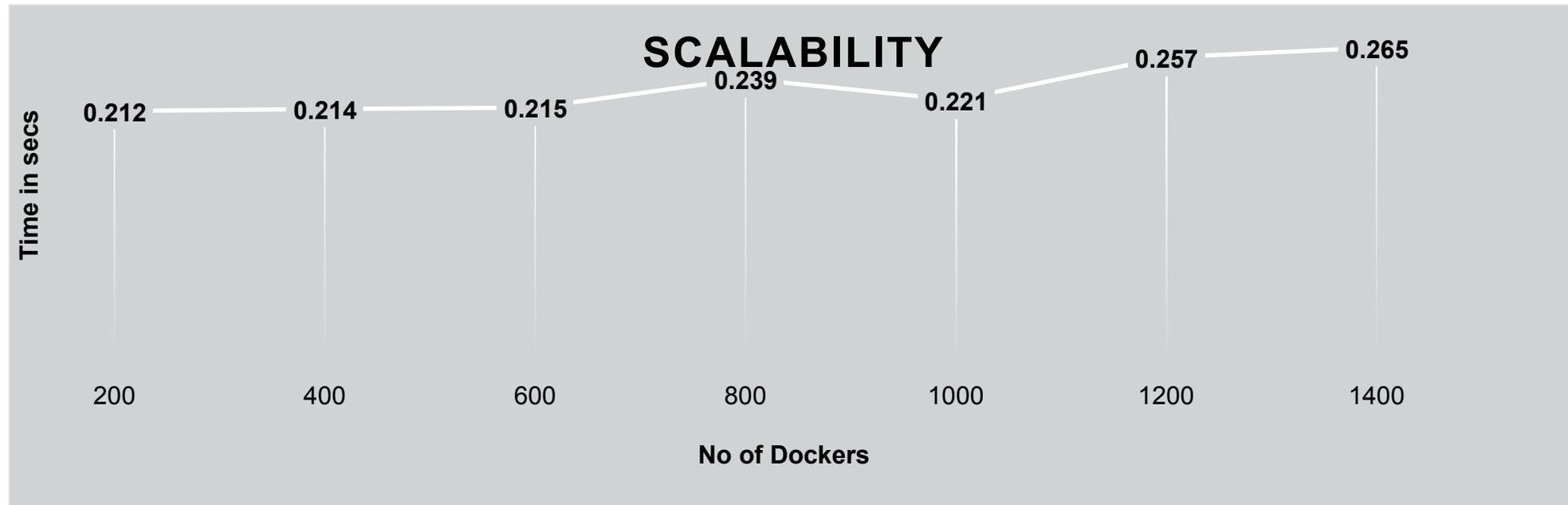
Remote (Out Of Band)

Management Node

PowerAPI Daemon



# Scalability – Monitoring with 1400 Endpoints



# PowerAPI with RAFPA - Key Benefits

## Leverage

- Easily Leverage Power measurement and Control capabilities of hardware and extract maximum benefits

## Help developers

- Help developers to add power and energy efficiency to their optimization criteria

## Energy aware scheduling

- Opportunities exist for Energy aware scheduling

## Flexibility

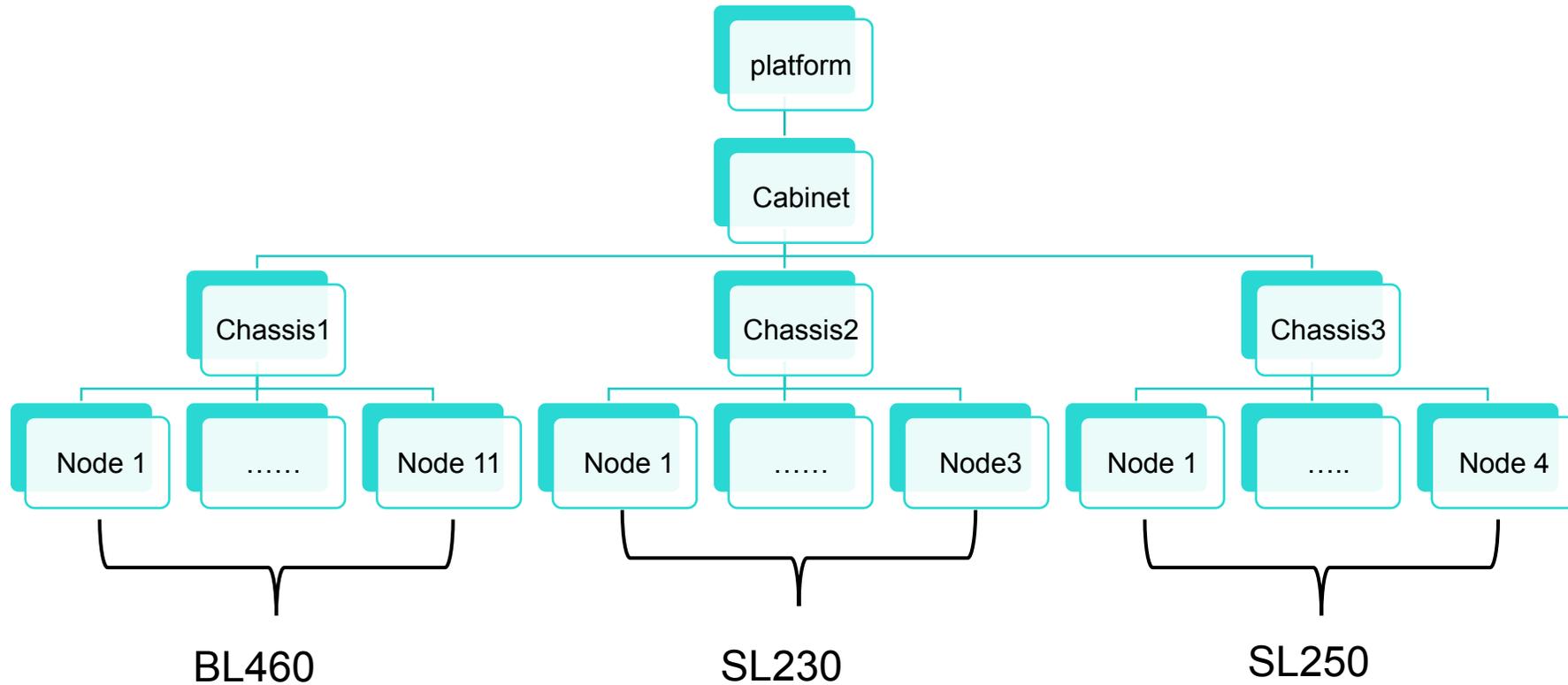
- More flexible with External Power Suppliers and Cooling Systems



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**Demo**

# Power Monitor and Control – Demo Setup



```
root@router:~/DaemonTesting/router/daemon#
```

14. client 20. router 21. chassis1 22. chassis2 23. chassis3

```
root@router:~/ServerDaemonTesting/DaemonTesting/router/daemon# . ./client /opt/pwrapinew_final/
root@router:~/ServerDaemonTesting/DaemonTesting/router/daemon# ./rtr0
```

# Current Status & Next Steps

- RAFPA Code submissions into PowerAPI GitHub
  - OSRB approval obtained
  - Presentation & demo to Sandia Labs completed
  - Code submission into PowerAPI GitHub repository completed
  
- Explore feasibility on non-ILO Redfish compliant systems (Supermicro & next-gen Exascale platforms)



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**Thank You**